UNITED STATES ARMY AVIATION TEST BOARD
Fort Rucker, Alabama 36362

STEBG-TD

5 FEB 19

SUBJECT: Letter Report, Military Potential Test of PE26X3 Spark Plugs, USATECOM Project No. 4-4-5406-01

USATECOM Project No. 4-4-5406-01

TO: Commanding General
US Army Aviation Materiel Command
ATTN: SMOSM-EG (Mr. Runde)
St. Louis, Missouri 63166

1. References.

a. Letter, STEBG-LEAE, US Army Aviation Board, 11 February 1963, subject: "Test of Iridium and Platinum Spark Plugs in CH-37 Aircraft," with 1st Indorsement, SMOSM-EG, US Army Transportation Materiel Command, 6 March 1963.

b. Letter, SMOSM-EG, Headquarters, US Army Aviation Materiel Command, 23 July 1963, subject: "Flight Testing of Army Aircraft Spark Plugs at US Army Aviation Test Board, Fort Rucker, Alabama," with 1st Indorsement, US Army Test and Evaluation Command, 16 August 1963.

c. Letter, SMOSM-EG, Headquarters, US Army Aviation Materiel Command, 11 October 1963, subject: "Flight Testing of Army Aircraft Spark Plugs at Fort Rucker, Alabama."

d. Plan of Test, General Items Division, Directorate of Engineering, US Army Aviation Materiel Command, undated.

2. Authority.

a. Directive. Letter, AMSTE-BG, Headquarters, US Army Aviation Test and Evaluation Command, 12 March 1964, subject: "Test Directive for Military Potential Test of PE26X3 Aircraft Spark Plugs, USATECOM Project-Task Number 4-4-5406-01."

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b. Purpose. To determine the suitability for qualification of the PE26X3 spark plug for use in the 0-335-5 and -6 engine.

3. Background.

a. During the past three years the General Items Division, Headquarters, US Army Aviation Materiel Command, has sponsored a series of qualification tests of spark plugs for reciprocating engines in Army aircraft to establish additional sources of supply. These tests were conducted by the US Army Aviation Test Board (USAAVNTBD) in the vicinities of Fort Rucker, Alabama, and Fort Benning, Georgia. Types of plugs tested were the standard massive electrode, platinum electrode, and iridium electrode. These spark plugs were furnished by major manufacturers and submitted to the Army for consideration.

b. Reference 2a stated that the results obtained by testing the PE26X3 (iridium electrode) plugs in an 0-335-5 engine would also be considered applicable to the 0-335-6 engine.

c. The USAAVNTBD was directed to install these plugs in OH-13G Serial Number 52-7899, assigned to the Second Aviation Battalion, Second Infantry Division, Fort Benning, Georgia (reference a).

d. Engine fuel used throughout the test was 115/145 octane with TCP additive.

4. Findings.

a. Visual inspection revealed no evidence of over-torquing.

b. Prior to installation, all spark plug gaps were checked and found to be at .014 inch. The resistance of each plug was measured in ohms and was as follows:

Position	Cylinder					
	1	2	3	4	5	6
TOP	2900	3100	3000	3100	3000	3100
BOTTOM	3000	3200	3100	3200	3100	3000

The plugs were removed after 385 test hours. Resistance, gap clearance, and breakdown pressure in pounds per square inch (p. s. i.) at removal were as follows:

Cylinder and Position	Resistance	Gap Clearance	Breakdown (p. s. i.)
1 Top	3200	.016	150
1 Bottom	3100	.017	140
2 Top	3100	.017	145
2 Bottom	3200	.015	145
3 Top	3000	.016	150
3 Bottom	3100	.018	145
4 Top	3100	.019	160
4 Bottom	3200	.017	150
5 Top	3000	.016	145
5 Bottom	3100	.017	160
6 Top	3100	.018	160
6 Bottom	3000	.017	140

c. Spark plugs installed at No. 3 bottom, No. 4 bottom, and No. 6 top had heavy deposits of lead. Those spark plugs installed at the other positions had light deposits of lead.

d. Bridged electrodes, cracked insulator tips or barrels, excessive oil or carbon deposits, electrode deterioration, excessive gap growth, or flashover conditions were not found. Equipment was not available to test for gas leakage.

5. Discussion.

This test was conducted on only one engine on which no malfunctions were attributed to the spark plugs. Testing of spark plugs on more than one engine at a time would provide a broader sample of information on which to base valid recommendations.

6. Conclusion.

The PE26X3 spark plug is suitable for use in the 0-335-5 and -6 engines and is therefore qualified.

7. Recommendation.

It is recommended that the PE26X3 spark plug be qualified as an alternate plug for the 0-335-5 and -6 engines.

A. J. RANKIN
Colonel, Armor
President

Copies furnished:

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